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THE CLASSICAL SYSTEM OF EDUCATION.

Higher Education and the War. By Prof. John Burnet. Pp. x+238. (London: Macmillan and Co., Ltd., 1917.) Price 4*s*. 6*d*. net.

PROF. BURNET'S book is entitled "Higher Education and the War." He states that most of his criticisms were published in 1913 and "are not, therefore, unduly influenced by the war." That they have been somewhat influenced thereby is thus admitted; this is the chief way the war comes in, for the work is mainly an appreciative account of the German system of higher education.

As such it will be useful if only to show those people who are ignorant of the fact—and they are legion, as the letters from clergymen and others which so frequently appear in the newspapers indicate—that this system is more completely based on the "humanities" than that of any other country—was, in fact, until the end of the nineteenth century practically confined to them. Until the present century no one in Germany could enter a university, or become a member of the Civil Service, or embrace any of the learned professions without a passing-out or maturity certificate from one of the "Gymnasien." The curriculum in these is almost purely classical, for of the nine years spent in these schools all have to be devoted to the acquisition of Latin and six to that of Greek, other subjects being allowed to play a very subsidiary part in the scheme of education, whilst science teaching is practically nil. This is an ideal "humanistic" education, carried out with all the disciplinary thoroughness of the German. All the governing classes of Germany of the present day were reared upon it—with the results which we are now experiencing. Prof. Burnet seriously suggests that we should adhere to such a plan of education for this country; and there are many people who agree with him. Did not the *Times* critic describe his book as "so good that it is difficult to review," and discover "nothing to find fault with" in it?

Prof. Burnet's work is an obvious attempt to counteract the "Neglect of Science" agitation. Yet he is constrained to admit that very few of the greatest scientific discoveries have been made by Germans (he might almost have said, none); what they have done is to organise scientific work. He states that for ourselves "what is wanted is really a better education for the leaders of commerce and industry, so that they may gain a rather wider outlook than they have at present." And for this wider outlook Prof. Burnet offers this German system. He tells us that the Prussians understand these things better than we do; that they organised their educational system to train an *élite* to do the highest work of the nation. "We have been furnished with such an *élite* by the public schools and by Oxford and Cambridge," which "do much of the best educational work that is done in this country to-day, and we should be careful not to meddle rashly with institutions which are more and more becoming the envy and admiration of Europe and America."

Since the beginning of the present century some modification has been introduced into the German system, admission to the universities and the rest being possible through schools other than the Gymnasien proper. But although these devote less time to Latin than the Gymnasien, and still less to Greek, the education of the boys is almost entirely confined to languages and literature, so that it remains emphatically literary in character. And it may be added that these alternative schools, perhaps because they are new, are looked down upon by the higher social classes in Germany, so that the purely classical Gymnasien are yet by far the most frequented by those who desire to enter the universities, the Civil Service, and the learned professions. The whole German system, in fact, even with the modification alluded to, is based upon the idea—which Prof. Burnet strongly upholds—that the mind can be trained only by the study of languages and literature—preferably those of extinct races—as distinct from the modern English and American view that the intelligence can be developed as well, if not better, by the study of natural science, and that it is inexpedient to put all boys and girls through the self-same educational mill irrespective of their innate tendencies, and regardless of the fact that the particular mill which the humanists advocate is neither more nor less than abhorrent to the majority of healthy-minded children. Indeed, like most other humanists, Prof. Burnet holds that an education based upon the acquisition of knowledge which is of no value in after life is more useful than one based on knowledge which is of permanent value, and regards the sarcastic definition of education as "the sum of all we have forgotten" as a not altogether unjust appreciation of what education really should be. He considers that "the right of children to be treated as human beings," which in his view is to have their school training based entirely upon "humanistic" studies, is now seriously threatened by those who hold that the future of education may, and must, be strengthened by the introduction of a basis of natural science.

Prof. Burnet's contentions are not without such discrepancies as are inseparable from the pursuit of a weak line of argument. For while he contends that the Latin rather than the English grammar ought to be taught first, "when the memory is strong and the reasoning powers undeveloped. Children love to learn things by heart, whether they understand them or not. . . . On the other hand, they resent, and quite rightly, all appeals to their reasoning powers," he states, a little further on,

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that "the Humanist ideal of education . . . is that the pupils should above all be led to feel the meaning and worth of what they are studying." This, one would have thought, is very much the ideal of those who advocate the introduction of the study of natural science into general education. Incidentally, one wonders to what kind of children Prof. Burnet alludes in the sentence above quoted, for the experience of most people surely is that an intelligent child wants to know the how and the why of everything!

Prof. Burnet's conclusions are that all boys (and girls?) should be educated on strictly classical lines until the age of seventeen, and that during the next three years the "humanistic" character of the education should be continued by compelling philosophy to hold the central place in the scheme. The rest of the organisation of their education would then present no difficulty to Prof. Burnet, but if the student continues with the "humanities," he ought to have a smattering ("know something") of science; if he goes in for science, he ought to continue with the "humanities." Prof. Burnet admits that at present students who are to proceed with the "humanities" show little desire to add a knowledge of science to their attainments, and certainly most students who have adopted science show no desire at all to continue with the "humanities"! At the end of the three years of philosophy, *plus* the "humanities," *plus* science, he would give an Arts degree, which must be a preliminary to all other degrees and would "mark the commencement of university work proper"; this degree would, in fact, be the equivalent of the German school leaving certificate. Even the study of Medicine is not to be commenced until the Arts degree is attained—a crude reversion to the old, abandoned Oxford system.

Prof. Burnet admits that his scheme for students of medicine is not in accordance with professional opinion in this country, and contrasts this with the expressed opinion of German medical faculties in favour of their own system. "There can," he says, "be no doubt, I suppose, that the *average* qualifications of medical men in Germany are much higher than in this country, and the most natural explanation of this seems to be that they are better educated and more mature when they begin the study of Medicine." From extensive personal knowledge of medical men in both countries I may venture to differ entirely from Prof. Burnet as to the correctness of his supposition—the reverse being, in my opinion, true—but I would be diffident in ascribing this to differences in scholastic training, seeing how much better organised is the teaching in our medical schools as compared with that in German universities. The superiority of the latter institutions has hitherto lain in the opportunities afforded in them for research—but that is another story.

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APPLIED CHEMISTRY IN THE UNITED STATES.

Annual Chemical Directory of the United States. Edited by B. F. Lovelace. Pp. 305. (Baltimore, U.S.A.: Williams and Wilkins Co.) Price 5 dollars.

THIS book, although primarily intended for circulation in the United States, has many features of interest deserving the attention of those who are concerned in the production of similar works in this country. It is a trade directory on a very broad gauge, and appeals to every section that is interested, even remotely, in chemical science and the chemical arts—industrial organisations of various kinds, scientific societies, colleges, professional analysts, consultants, chemical engineers, patent agents, manufacturers of chemical plant, etc. In view of the rapidly extending trade relations of America with the rest of the world, and especially with Europe, it affords a considerable amount of useful information on chemical matters in Continental countries. So far as we have been able to judge, it has been carefully compiled, although, as might have been anticipated in a work of this magnitude, a few omissions and occasional press errors are to be met with. Certain of the agricultural colleges and stations in this country are omitted from a list which professes to be comprehensive. No mention is made of several important schools of chemistry in Great Britain, and the list of technical colleges is incomplete. The list of officers of some of our scientific societies is also out of date. There are a few mistakes in the spelling of proper names, *e.g.* Brulington House for Burlington House, Wil for Will, etc.; but, considering the large amount of material to be dealt with, the number of such errors is remarkably small.

A valuable addition to the work is an annual review of progress in applied chemistry in the States during the year preceding publication. This for 1916 presents many features of interest. As might be expected, the war has had a profound influence on the course of development of the chemical arts in America, and there has been a great extension of chemical industry in that country. In 1914 the United States, like Great Britain, suddenly realised that it had grown to be largely dependent on Germany for hundreds of things of a chemical nature that were necessary for its daily comfort and convenience. This domestic demand, as well as the effort to meet the enormous foreign demand for munitions, etc., greatly stimulated all chemical industries in that country. The older concerns largely increased and improved their output, and in many cases branched out into new lines, and a number of new companies were organised and are now firmly established. So great is the demand for chemists that factories are offering attractive salaries to young men who have scarcely completed their academic training. This revival is, of course, reacting upon the colleges and schools

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